DEALING WITH NUISANCE AND DEPREDATING BLACK BEARS

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Abstract: Black bears (*Ursus americanus*) are a valued resource in North America, but pose many challenges to resource managers. They may be managed in 1 or more ways, including sustained yield harvests, nuisance animal control, or conservation management. Many black bear populations are stable or increasing, and combined with expanding human populations, increased development, and recreational activities, are leading to an increase in human-bear conflicts. Historically, methods such as relocation, general hunting seasons, or special hunts have been used in an effort to reduce bear density and damage, or to target individual offending animals. Many resource managers now operate under an increased set of constraints and limitations on methods with which to address these problems. There is considerable room for improvement in our ability to manage bear populations and reduce damage levels. New approaches, however, must meet criteria of socio-political acceptability, legal and regulatory authority, effectiveness, costs, and duration of protection. Most successful programs to reduce human-bear conflicts usually employ a diversity of carefully calculated approaches, hence, using truly integrated pest management (IPM) strategies. Bear population management, habitat management, and people management should all be part of the strategy.

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Black bears range over much of the forested areas of eastern and western North America. Historically, they were considered pests or threats to human life and property and, hence, were extirpated or reduced to very low numbers in many eastern and midwestern states. The basic biology, ecology, and management of bears has been reviewed by Kolenosky and Strathearn (1987), Pelton (1982, 2000), and Witmer et al. (1998). Currently, black bears are considered common in many of the western states and provinces. Populations appear to be stable or increasing (Whittaker and Burns 2001). Black bears in North America are generally considered to be "charismatic megafauna" and, as such, tend to maintain a high public profile. While views are mixed, it seems that most people have altruistic or humanistic views towards bears, have an appreciation for bears, consider them quite intelligent, and often take an active role in how bears are treated and managed (Kellert 1994). Significant values attributed to black bears include ecological roles, recreational value (both consumptive and non-consumptive), income added to local economies, and the value of "bear products" (both legal and illegal). Black bears, along with other forest carnivores, are often used as an important indicator of forest ecosystem "health" and biodiversity (Witmer et al. 1998).

How black bear populations are managed varies considerably, although state and provincial wildlife agencies have generally relied upon sustained harvest programs to manage populations (Miller 1989, Pelton 2000). Caughley and Sinclair (1994) identified 4 basic approaches to wildlife population management: 1) make it increase (conservation management); 2) make it decrease (damage/conflict control); 3) harvest at a sustained yield (game management); or 4) leave it alone, but monitor.

Growing bear populations, expansion of human habitations and activities into bear habitats, and restrictions on methods used to manage bear populations have all contributed to increased difficulties for resource managers, certain commodity producers, and for landowners dealing with human-bear conflicts. In this paper, we review the nature of black bear-human conflicts, trends in complaints, traditional black bear population management, and other approaches to conflict management.

BLACK BEAR DAMAGE AND COMPLAINT TRENDS

There are many ways in which bears can come into conflict with humans. The main types include compromising human safety and damage to structures, apiaries, crops, livestock, orchards, regenerating forests, and game animal populations (Hygnstrom 1994, Pelton 2000). Type and extent of damage varies by region, time of year, setting, and between years. A decline in availability of natural forages (e.g., hard and soft mast) has often been attributed to increases in damage or conflict (e.g., Stowell and Willging 1992, Jonker and Parkhurst 1997).

Because damage is often localized, the overall amount of damage may seem minor. However, it can still be significant to individual property owners or crop/livestock producers (Vaughan and Scanlon 1989). Furthermore, some types of damage are tolerated more than others. For example, there is little tolerance when human safety is involved or when apiaries are damaged, but some damage to crops or trees is often tolerated.

There appears to be an increased trend in complaints about bear activities and damage. In Oregon, for example, black bear complaints averaged about 155 per year from 1985-89, but increased to about 499 per year from 1993-1997 (Oregon

Department of Fish and Wildlife, unpublished data). In Washington, black bear complaints numbered only 208 in 1995, but averaged 627 per year from 1996-99 (Washington Department of Fish and Wildlife, unpublished data). California, Colorado, and Idaho also reported large (>300) numbers of black bear complaints in 1998 (Whittaker and Burns 2001). There are many possible explanations that might relate to the increasing trend in number of black bear damage complaints (Table 1). Additionally, several factors may be involved in a region and factors may vary by year.

Table 1. Possible factors related to the increasing numbers of black bear complaints; the list is not meant to be all-inclusive and several factors may be involved in a given region or during a given year. Some components required of a black bear depredation management strategy.

A. Possible Factors Related to Increasing Black Bear Complaints:
1. Increasing human population
2. Increasing black bear population
3. Increasing human activity in black bear habitat or new generations of humans less savvy to black bears
4. Changes in land use practices and intensity
5. Changes in habitats and food sources
6. Long- and short-term weather patterns
7. Changes in bear harvest seasons and methods
8. Increased public awareness, media coverage
B. Some Components Required of a Black Bear Depredation Management Strategy:
1. Develop and implement a bear management plan including depredation policies
2. Keep bear population density low in conflict areas and bea rs sensitive to humans through hunting seasons
3. Monitor bear populations, individuals, and situations
4. Implement preventative measures
5. Capture and relocate or destroy problem bears
6. Education of the public

As noted, types of damage can vary from 1 location to another. In Oregon, for example, most complaints are related to human safety and property concerns, followed by forest damage, agricultural damage, and, lastly, livestock depredation (Oregon Department of Fish and Wildlife, unpublished data). In Washington, most complaints concerned human safety, followed by nuisance bear complaints, other complaints (property damage and agricultural damage), and, lastly, livestock depredation complaints (Washington Department of Fish and Wildlife, unpublished data). All categories showed substantial increases in number of complaints over the last 5 years except livestock depredations which, while low in total numbers, stayed about the same or declined. Black bear depredation to livestock primarily involves sheep and lambs, and the low numbers of complaints may be related to declining numbers of small livestock growers and to the large number of growers using a variety of non-lethal methods to reduce depredations (Connolly and Wagner 1998, Knowlton et al. 1999, National Agricultural Statistics Service 1999). On the other hand, Colorado and Utah each reported over 2,000 sheep and lambs lost to black bears in 1998 (National Agricultural Statistics Service 1999). The small number of forest damage complaints in Washington (versus Oregon) may relate to the fact that spring bear hunts have not been allowed for many years in Washington and the timber industry has relied on a large and growing supplemental feeding program to reduce bear damage to commercial trees (Ziegltrum 1994).

Whittaker and Burn's (2001) survey of western state and provincial wildlife agencies indicated that more than half of the respondents identified conflicts caused by black bears with regard to city/urban development, county land use planning, and private land management. In contrast, rarely was conflict indicated for public land management or recreation management. The respondents also most commonly listed minimizing black bear conflicts and damage as a major challenge facing black bear managers.

TRADITIONAL BEAR MANAGEMENT AND DAMAGE REDUCTION

Traditional bear management has relied heavily on hunter harvest (Miller 1989, Pelton 2000). It is difficult to monitor bear populations and determine densities. Resource managers have relied on monitoring and influencing hunter numbers and bear harvests as a way to indirectly monitor population status. Harvest information is supplemented, in some cases, by evaluation of specific data on age and sex of harvested animals. Harvest regulations involve setting seasons (e.g., spring, fall, and "hot spot" hunts) and methods of take (e.g., firearm type, baiting, use of hounds) within a game management unit system. Often, harvest regulations and objectives must vary by region. For example, bear populations in eastern Oregon and Washington must be managed differently than bear populations in western Oregon and Washington. Historically, spring hunts have accounted for greater hunter success than fall hunts, and harvest using baits or hounds is more successful than rifle or archery hunting not employing these methods (Beecham and Rohlman 1994, Litvaitis and Kane 1994). To a much lesser extent, trap and relocation has been a method of removing problem bears or reducing bear density in an area. While these traditional methods have not

entirely held bear populations and damage levels in check, their vigorous application and an attempt to stay ahead of developing situations have been fairly successful in many areas.

It appears, however, that bear populations are still increasing in many areas and we know damage complaints are increasing in many areas. This makes one wonder if traditional approaches to bear management are adequate for reducing conflicts. Indeed, there does not appear to be much correlation between estimated bear population size and bear harvest across states and provinces (Burch 1997, Whittaker and Burns 2001). Reported harvest as a portion of estimated bear population ranges from 2.5% to 15% with only California and Minnesota near the 15% harvest level. The Minnesota black bear population appears to be expanding rapidly despite the 15% annual harvest (D. Garshelis, personal communication). In his review of bear population management in North America, Miller (1989) stated that, while bear populations can be overharvested, most can sustain an annual harvest of 15% without a decline in population. Conservative harvest strategies are probably common with many game species in North America. This situation could be related to any of numerous factors. Many species were managed very conservatively for many decades after previous decades of over-harvest and, in some cases, recovery after extirpation and reintroduction. Wildlife agencies may also manage harvested species conservatively to avoid unintentional over-harvest (important with species difficult to census or monitor) and/or to assure abundant (and increasing) hunting and wildlife viewing opportunities. Additionally, conservative harvest rates may be more acceptable to citizens who accept hunting as a wildlife management tool, but may not hunt themselves. In the case of white-tailed deer (*Odocoileus virginianus*), it has been very difficult for some states to achieve adequate harvests to bring deer population densities down to goal densities (Witmer and deCalesta 1992).

Approaches to bear management have been changing dramatically in recent years. In some areas, number of hunters has been declining, resulting in less hunting pressure and reduced harvests. Additionally, an increasing acreage of lands, both public and private, are being put off-limits to hunting for various reasons. In like manner, when landowners cannot continue making an adequate profit by farming or livestock production, they may sell their land, resulting, in some cases, in further commercial or residential development. Finally, voter initiatives restricting bear harvest seasons and methods have been passed and enacted into law in various states and provinces, including Alberta, California, Colorado, Oregon, and Washington (e.g., Musgrave 1998). Similar initiatives have been defeated in other states (e.g., Idaho, Michigan). As a result, many "tools" used by wildlife managers to accomplish harvest objectives are no longer available. Examples of lost tools include spring hunts, use of hounds, use of bait, and the use of restraint devices (traps and snares). Rationale of members of the public supporting these restrictions may include subjective judgments on the treatment of bears (Pelton 2000). Resource managers fear that the resulting situation will allow bear populations to increase dramatically in some places with a corresponding increase in damage and incidence of human-bear encounters (see discussion in Beck et al. 1995). It appears, however, that some states have been able to recover from an initial decline in bear harvest after loss of methods such as hounds and bait by attracting more hunters and using more liberal seasons (e.g., Boulay et al. 2001).

Clearly, wildlife managers and others concerned with managing bear populations or damage are operating under an increasing set of constraints (Pelton 2000). It could be that black bear management in North America has been evolving and in many areas has moved from encouraging population decrease (persecution) to sustained yield management, but is now moving more towards conservation. In the future, it may approach preservation. This puts wildlife management in North America at a crossroads. What will the public allow or tolerate? What will commodity producers allow or tolerate? Who will have the authority, and to what level, to make wildlife management decisions? Who will pay for the changes in the way we do business? Many of these concepts were being explored in the early 1990s (e.g., Gilbert and Dodds 1992, Hawley 1993) and can be expected to become more acutely debated in the near future.

OTHER APPROACHES TO REDUCTION OF BEAR-HUMAN CONFLICTS

Practitioners of vertebrate pest management work within an arena of socio-political acceptability, legality, regulatory authority, effectiveness, cost and duration, and environmental compatibility (Fall and Jackson 1998). Managers and researchers are challenged to find new or improved methods of counteracting restrictions and limitations on traditional bear population and damage management. A wide array of approaches can be incorporated into an IPM strategy, including population management, habitat management, and people management (Giles 1980, Fall and Jackson 1998).

Other approaches, beyond traditional population management through harvest seasons, can be used to

reduce bear conflicts and damage. Bear conflict and damage reduction techniques were reviewed by Hygnstrom (1994) and include cultural methods, exclusion, frightening devices, repellents, trapping, shooting, and public education. Research into other approaches, such as fertility control (Miller et al. 1998) continue as well. Typically, an IPM strategy involves assessment of the situation and application of the least invasive damage reduction methods before more invasive methods are used. This has become true with problem bear management as well and often multiple methods are used, depending on the specifics of the situation (Hygnstrom and Hauge 1989, Vaughan and Scanlon 1990, Calvert et al. 1992, Stowell and Willging 1992, Jonker and Parkhurst 1997, White et al. 1997).

The difficulty of working in this arena is exemplified in agency survey results presented by Whittaker and Burns (2001): agencies, the sportsmen, and the general public often disagreed on their preference for methods to deal with nuisance or depredating bears. Most agencies rely upon education, advice, relocation, and agency kill as methods. Fewer agencies allow the complainant to kill the problem bear. Still fewer agencies use compensation payment or regulations to resolve the problem. Relocation is popular with the public, but much less so for the agencies. On the other hand, agencies prefer to have problem bears killed, which is not very popular with the public. When problem bears are killed, it is usually a state, provincial, or federal agency that conducts the operation. Some components of a management strategy to reduce bear depredations are listed in Table 1.

Cultural Methods

Many cultural methods are used to reduce the likelihood of bear-human conflicts. Perhaps the most widely used and successful method is the removal or adequate containment of human-generated trash and waste foodstuffs. Garbage dumps, dumpsters, and landfills have been relocated, closed, fenced, or otherwise been made inaccessible to bears. Educational programs directed at campers and backpackers have been implemented. There has been great progress in the production of bear-proof garbage containers (Holmshaw 1995, Schirokauer and Boyd 1998). As a result, most human-bear conflicts in many parks are now more likely to involve random encounters (Herrero and Fleck 1989, Gunther and Hoekstra 1998).

It is also important to determine the set of conditions, human activities, or land use practices that encourage conflict situations with bears. For example, certain forestry practices (e.g., thinning, fertilization) tend to produce forest stands more likely to be damaged by black bears (Witmer et al. 2001). Conversely, there are silvicultural options (e.g., species selection, delayed thinning, maintenance of higher levels of canopy closure, pruning lower branches, and genetic selection of tree stock) that can reduce the likelihood of black bear damage (Witmer et al. 2001). However, it is important to acknowledge that foresters, like other commodity producers, already work under a sizeable set of constraints in their land use practices. Additionally, it is often difficult to overcome traditions and customs that have been followed for many generations.

Likewise, crop growers can occasionally vary which crops they grow, where they grow particular crops, and can sometimes alter the surrounding habitats (Stowell and Willging 1992). In many cases, these actions can be used to reduce the likelihood of bear damage. The reader is reminded, however, that prediction of black bear damage is difficult at best.

Livestock producers can and do use numerous cultural (husbandry) methods to reduce the likelihood of losses to predators. Methods include lamb shedding, herding, night penning, and carcass removal (Connolly and Wagner 1998, Knowlton et al. 1999, National Agricultural Statistics Service 1999).

Exclusion

Excluding black bears from areas or structures that they wish to access is not an easy matter, typically is expensive and requires considerable maintenance. Barriers, whether electric or heavy woven-wire or both, are sometimes used to protect apiaries, cabins, back-country camps, landfills, high-value properties, and sheep (Storer et al. 1938, Pratt 1990). Excluding bears from large forested areas would be difficult, expensive, and, in many cases, counterproductive to managing bears as an important and valued part of forested ecosystems. Metal flashing can be used to keep bears out of hunter tree stands or out of highly valued trees. An advantage of exclusionary barriers is that once in place, they usually last a long time with proper maintenance.

Supplemental Feeding

Supplemental feeding is a wildlife management technique used in a variety of situations to support populations or reduce damage, with big game on winter range being a classic example. In response to public aversion to lethal control of black bears, foresters in the Pacific Northwest have been conducting a large and growing supplemental feeding program for bears (Ziegltrum 1994). A pelleted feed, rich in sugars, is placed out in large feeding barrels and replenished regularly from spring through early summer in areas of historic or anticipated high levels

of bear tree damage. Although success has not been well documented yet, it appears that this program has greatly reduced bear damage in some areas (G. Ziegltrum, personal communication). The program is costly, and costs increase each year as additional feeders are put out. Additionally, there is some concern that supplemental feeding programs may increase carrying capacity for animals in the area, leading to more problems in the future. For example, black bear females with access to garbage were heavier and more productive than females without access to garbage (Rogers et al. 1974). It has also been speculated that feeders may be dominated by large, adult bears and may be less available to the targeted segment of the bear population—adult female bears and smaller bears. Ongoing research with remote cameras suggests, however, that a variety of bears are actually able to access the feeders at various times. Because bears readily habituate to the feeders, it might be possible, in the future, to place fertility control materials in the feeders and thus reduce the bear population over time. More research is needed to fully understand feeding as an option to reduce bear damage. Specifically, impacts to bear populations (biological and behavioral), benefit-cost analysis, and fertility control should be primary research objectives.

Repellents, Aversive Conditioning, and Frightening Devices

Capsaicin spray is commonly used as a bear repellent for personnel protection (Rogers 1984), but how bears respond to the spray and the duration of the response are variable (Herrero and Higgins 1998). Bears may actually be attracted to areas where capsiacin is applied proactively as a repellent. Loud noises and cracker shells are also used to frighten bears, but again, results are often short-lived and variable (Hunt 1984; Miller 1983, 1986). Rubber and plastic bullets and chemical aversive agents may deter bears in some situations (Colvin 1975, Gillin et al. 1994), but did not deter black bears that were habituated to garbage or were depredating bee hives (Dorrance and Roy 1978, McCarthy and Seavoy 1994). Repellents (a bittering agent, a chemically hot material, and grizzly bear feces) applied to the base of commercial trees vulnerable to black bear damage in northern Idaho appeared to reduce damage in a preliminary field trial (Witmer et al. 2001).

Dogs can be used to keep bears away from human habitations and crops, and to condition bears to be wary and avoid humans (Green and Woodruff 1989, Derr 1999). How well dogs perform in this task depends on the breed as well as how they are reared, trained, and handled (Green 1990).

Relocation and Rehabilitating of Problem Bears

Relocation is still used to help reduce human-wildlife conflicts in some situations. For example, Armistead et al. (1994) reduced sheep depredation from black bears by relocating problem bears to areas without sheep. Relocation, however, is becoming a less acceptable solution for many reasons (Thompson and McCurdy 1995, Washington Department of Fish and Wildlife 1996). Although we now have good capabilities with bear live-traps and snares, trapping and relocating bears is expensive and not without an element of danger to bear and human alike. Released bears usually try to return to familiar territory and long distance movements are common (Rutherglen and Herbison 1977, Alt 1980, Fies et al. 1987, Inglis 1992). Black bears may have to be moved 161 km to have a high probability that they will not return to the original capture site (Alt 1980, Rogers 1986). Mortality rates (from starvation, highway and other accidents, aggressive encounters with resident animals, and other factors) of relocated animals are typically high. Additionally, relocated nuisance bears may continue their nuisance activities after relocation, so that the problem is merely transferred from one location to another. There is also the potential for disease transfer when animals are relocated over considerable distances. It is becoming increasingly difficult to find appropriate and publicly acceptable sites for relocations. The result of all these considerations is that many states have adopted a 2-strikes-you're-out policy with relocated bears (Harms 1977, Oregon Department of Fish and Wildlife 1993, Washington Department of Fish and Wildlife 1996). If the bear gets into trouble with humans after being relocated, it is captured and euthanized.

There continues to be an interest (primarily in the private conservation sector) in attempting to rehabilitate captive nuisance or orphaned bears for eventual release back into natural settings. While it appears that this can be accomplished in some cases, it is difficult, time-consuming, and expensive (Maughan 1995). The costs, liability, and inability to process very many bears may prevent greater use of this approach to the resolution of problem bears.

Damage Compensation

Damage compensation payments are used for bear damage in some states. This approach is generally popular with the public and commodity producers, but not with wildlife agencies and sportsmen (Whittaker and Burns 2001). The latter is probably because of costs involved, who pays, and the fact that compensation programs typically do not address the source of the problem. Colorado has a compensation

program for black bear, cougar (*Puma concolor*), elk (*Cervus elaphus*), deer (*Odocoileus hemionus, O. virginianus*), and pronghorn (*Antilocapra americana*) damage. The program has annual expenses of about $1.5 million with about $650,000 paid in claims, $450,000 in material purchases (primarily fencing), and $500,000 in personnel and administrative costs (Steve Porter, Colorado Division of Wildlife, personal communication). About 55% (200 claims) of the total claims each year are for bear damage with about $250,000 paid in bear claims each year. The main bear damage areas are livestock depredation, property (bee hives, structures, vehicles) damage, and orchard damage. As another example, Stowell and Willging (1992) discussed the history, advantages and disadvantages of the bear damage compensation program in Wisconsin. There seems to be a general agreement across many states that an adequate harvest of bears during the regular hunting seasons helps keep the number of damage complaints down (Garshelis 1989, Hygnstrom and Hauge 1989). In addition to concerns about having adequate funds for compensation programs, there is concern with escalating costs and sources of program funds. Should general tax revenue funds be used, or should sportsmen's fees entirely fund the program? Can federal, Pittman-Robertson funds be used in these programs? Having adequate numbers of trained personnel to operate the program in a prompt, efficient, and consistent manner is also a concern.

Public Education

It appears that public education and tolerance of wildlife damage are becoming a more important part of vertebrate pest management (Gourley and Vomocil 1987, Garshelis 1989, Kellert 1994, Koch 1994, Thompson and McCurdy 1995). For example, it is our experience that many commercial forestry companies have become more tolerant of wildlife damage and also more sensitive to public relationships regarding how they deal with wildlife damaging their property. Winning public support for lethal control of bear populations in forest damage areas can be difficult with non-hunting members of the public (Gourley and Vomocil 1987). This suggests a strong and growing need to focus damage reduction programs on non-lethal methods, or if lethal methods are used, to not remove animals indiscriminately, but instead to target the individual problem animal (Accord et al. 1994, Knowlton et al. 1999).

In most wildlife damage situations, there is probably some relationship (although not necessarily linear) between the amount of damage and the density of damage-causing species. With carnivores, however, a few individuals can cause substantial problems or damage. Researchers have attempted to develop methods that target offending individuals, but there are usually many limitations to our knowledge of the species' biology and ecology, the circumstances under which the damage is occurring, and the methods available to us (Knowlton et al. 1999). Even if a method is developed that very specifically targets problem animals, there is no guarantee the public will accept its use. An example is the livestock protection collar (LPC) which is placed around the neck of a sheep and contains a lethal dose of Compound 1080 (sodium monofluoroacetate). The only predator affected by the LPC is one that bites into the neck of a sheep wearing the collar. Use of the LPC was recently (1998) made illegal in California through a voter initiative that restricted or banned the use of several wildlife damage management techniques.

Loss of the ability to use common methods for wildlife damage management (toxicants, repellents, immobilizing agents, anesthetizing agents, traps and snares, and dogs) is making the resolution of human-wildlife conflicts more difficult (Pelton 2000). Public acceptability is not the only factor involved. Effectiveness of the method, cost of application, real or perceived hazards, and the interest of the private sector to produce and market products can all affect availability of methods. Research on DNA and radioisotope applications, behavior of problem animals, shock collars, and auto-collaring snares may help target problem animals in the future. Use of appropriate combinations of methods and the use of adaptive management may also improve human-wildlife conflict resolution in the future.

An important part of public education is teaching the public how to reduce the likelihood of adverse encounters with wildlife (Pelton 2000). There will always be some risk to humans when bears are in the vicinity, however, and agencies must weigh the liability when designing and implementing bear management programs.

Educational efforts should not end with the general public. Biologists, pest control operators, and agency personnel must also be "re-educated" to deal with changing wildlife-human interactions, public attitudes, and rapidly changing technologies and communications. Wildlife managers may need to rise above the paradigm that 1) bears that come into repeated contact with humans or occasionally damage resources become habitual problem bears, 2) problem bears should be removed from the population, and 3) it is not always necessary to carefully consider alternatives or the bear's contribution to the gene pool (Taylor et al. 1989). Alternatively, wildlife agencies will need to make difficult, informed decisions regarding human-

wildlife conflicts and their resolution and the management of wildlife populations in general. Standing by those decisions, in the face of increasingly polarized segments of society, may be their most difficult challenge.

FUTURE CHALLENGES

Wildlife managers face many challenges in providing for the many public and commercial needs of citizens that relate to wildlife populations and the reduction of adverse interactions. Much of the decision-making authority of wildlife management agencies is now being legislated or strongly directed by political bodies independent of standard legislative and rule-making processes. Managers and researchers will be continuously challenged to find innovative and publicly acceptable methods to maintain a balance between the needs and desires of humans and the needs and propensities of black bears. The involvement of the public will be, and should be, an important part of the process. A list of needs and challenges in dealing with nuisance and depredating bears is provided in Table 2. Although progress is being made in many areas, there are probably too few persons and too few funds being dedicated to the more timely resolution of human-wildlife conflicts.

Table 2. Some needs and challenges of dealing with nuisance and depredating bears.

1. Working across jurisdictions, bio-politics
2. Better population monitoring
3. Better prediction of damage and identifying problem bears
4. Improvements in deterrents and aversive conditioning
5. More application of research findings
6. Apply bear-people management to larger areas
7. More education programs, surveys of the public, invo lvement of user groups
8. Use of adaptive management
9. Effects of development, habitat protection
10. Use of long-term studies and data sets
11. Economic assessment of damage and control
12. Effective combinations of methods
13. Consistent and timely reporting and damage investigation
14. Adequate personnel and funds for research, management, claims

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